

REMARKS

By this amendment, claims 3, 16, 18 and 21 have been cancelled, claims 1, 4, 8, 13, 17, 19 and 22 have been amended, and claims 28 and 29 have been added. Thus, claims 1, 4-9, 13-15, 17, 19, 20 and 22-29 are now active in the application. Reexamination and reconsideration of the application are respectfully requested.

In items 1-12 on pages 2-16 of the Office Action, the Examiner has presented prior art rejections under 35 U.S.C. 103(a) of all of the pending claims 1-27. These rejections are based upon Park et al. (U.S. 7,100,743), Goodnight (U.S. 6,457,561), Nobuo et al. (JP 62-44108), Khoo et al. (U.S. 5,842,420), Andrione (U.S. 4,493,226) and Andrione '859 (U.S. 4,386,859).

Although Applicants do not acquiesce as to the merits of these rejections, in order to advance prosecution of this application, each of the independent claims 1 and 13 has been amended to clearly distinguish over the applied prior art.

With exemplary reference to present Fig. 1, claims 1 and 13 now specify that the crankshaft 24 comprises an eccentric shaft 25, and a main-shaft section 27 provided under the eccentric shaft 25. Further, the claims now specify that the hollow cylinder (of slant path 42) is inclined with respect to the rotation axis of the crankshaft 24, and that a vent hole 49 is provided at an upper section of the hollow cylinder. Further, as illustrated in Fig. 1, the vent hole 49 is required to be formed of a first part and a second part, wherein the first part extends upwardly along the rotation axis of the crankshaft 24 from an off-center position with respect to the rotation axis of the crankshaft 24 at an upper section of the hollow cylinder, and that the second part extends from an upper end of the first part to an upper opening that opens into the container 18 and is located at an upper end of the main-shaft section 27.

Previous claims 3 and 16 had recited the presence of the vent hole 49. In rejecting claims 3 and 16, the Examiner cited the Andrione '226 patent for teaching "a vent hole 56 provided at an upper section, Figure 4, of a centrifugal pump, 20 and 30, opening into a container 10."

However, the Andrione '226 patent discloses a vent hole 56 disposed at a steep incline with respect to a rotation axis of the crankshaft 18. When the Andrione '226 compressor having a crankshaft with such a vent hole is operated under a condition in which a large amount of oil is pumped, a portion of the oil may enter the vent hole. The oil that enters the vent hole is carried

to the upper end of the vent hole by the centrifugal force, and is then discharged due to the inclination of the vent hole. However, as the oil moves up through the vent hole, the oil will prevent any gas from discharging through the vent hole.

Whereas, with the present invention as set forth in claims 1 and 13, the vent hole (49) is required to include a first part and a second part, wherein the first part extends upwardly along the rotation axis of the crankshaft from a position off-center with respect to the rotation axis at an upper part of the hollow cylinder, and the second part extends from an upper end of the first part to an upper opening that opens into the container (18) and is located at an upper end of the main-shaft section (27). Due to this configuration as claimed, the centrifugal force is applied to both the oil and the gas in the first part of the vent hole (49), but a greater centrifugal force is applied to the oil, such that the gas and oil are separated in the radial direction of the first part of the vent hole (49). This separation between the gas and oil prevents the oil from disturbing the gas flow in the first part of the vent hole (49). Furthermore, a portion of the separated oil flows back down to the hollow cylinder, which further prevents the oil from disturbing the gas flow in the first part of the vent hole (49). With the configuration as claimed, the amount of oil which is discharged through the vent hole (49) is relatively small compare to the amount of oil that is supplied to the sliding parts and the like. As such, sufficient oil can be supplied to the sliding parts for adequate lubrication.

Thus, the Andrione '226 patent fails to disclose or suggest a vent hole such as that required by claims 1 and 13, wherein a first part of the vent hole extends upwardly along the rotation axis of the crankshaft from a position that is off-center with respect to the rotation axis of the crankshaft.

Accordingly, in view of this clear distinction between the present invention as now recited in claims 1 and 13 and the prior art of record, it is believed apparent that a person having ordinary skill in the art would not have found it obvious from the prior art to modify the Park et al. configuration in such a manner as to result in or otherwise render obvious the present invention of claims 1 and 13. Therefore, it is respectfully submitted that claims 1 and 13, as well as the claims depending therefrom, are clearly allowable over the prior art of record

The Examiner's attention is also directed to the dependent claims which set forth additional features of the present invention and further define the invention over the prior art. For example, the Examiner's attention is directed to the new dependent claims 28 and 29 which further define the vent hole (49) by the requiring the second part of the vent hole to be inclined with respect to the first part of the vent hole.

It is noted that a few amendments have been made to the specification in order to make two corrections (changing "vent path 42" to --vent hole 42-- and changing "crankshaft 42" to --crankshaft 24--), as well as by providing language as antecedent for the terms now used in the claims. All of the features added into the claims and the specification are clearly depicted in the drawing figures and, in particular, in Fig. 1.

In view of the foregoing amendments and remarks, it is respectfully submitted that the present application is clearly in condition for allowance. An early notice thereof is earnestly solicited.

If, after reviewing this Amendment, the Examiner feels there are any issues remaining which must be resolved before the application can be passed to issue, it is respectfully requested that the Examiner contact the undersigned by telephone in order to resolve such issues.

Respectfully submitted,

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